

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

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INQUIRY REGARDING CARRIER
Docket No. 03-104
CURRENT SYSTEMS, INCLUDING
BROADBAND OVER POWER LINE
SYSTEMS

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To: The Commission

REPLY TO COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE (ARRL)
AND ADDITIONAL COMMENTS

BY

MARK S. HARRIS
KD5FNV

My interest in this proceeding relates to the interference potential of Broadband over Power Line (BPL) technologies to radio communications in the range of 2 to 80 MHz. The technical filing by ARRL is an accurate representation of facts given what is known about radio propagation and antenna radiation patterns. I agree with the findings of the ARRL about the interference potential of BPL. There is no question that BPL technologies in any form if operated at radio frequencies and conducted on overhead power lines will radiate some energy away from the intended conductor. The consumer grade modem interface used to connect to personal computers will not be a sensitive radio receiver. This is because BPL is not intended to be a "wireless" form of communication. But, its operation at radio frequencies and transmission along wires which according to ARRL studies would be good antennas at those frequencies would by physical law cause it to radiate a signal. It is this unintended radiation that the Federal Communications Commission must strictly regulate in order to prevent interference to licensed users of the radio spectrum. I will attempt to present different aspects of this interference potential.

If widely deployed, BPL would cause substantial interference to all radio communications in its operating range. Once radio spectrum is polluted it cannot be cleaned

unless all devices causing the pollution cease to operate. Once "out of the box" BPL will be difficult to contain. Users in the proposed 2 to 80 MHz range will suffer severe interference. They include commercial airlines entering and leaving U.S. airspace on international flights, amateur radio communications, and numerous federal government agencies including U.S. Customs, U.S. Coast Guard, Federal Bureau of Investigation, Federal Emergency Management Agency, and all military branches. It has recently come to my attention that many Federal HF spectrum users are not aware of this issue and its relevance to their communications. The Commission should investigate this aspect with the National Telecommunications and Information Administration before proceeding any further.

The shortwave (HF) spectrum from 3 to 30 MHz is a source of entertainment and information unto itself and cannot be replaced by the internet. It follows that a type of internet technology such as BPL should not be allowed to interfere to such a degree as to make it unsuitable for monitoring. Many shortwave signals of interest are weak and barely received in the United States. A strong local BPL signal would render the HF spectrum useless to all but the strongest signals.

A "pristine" local monitoring environment should exist on the shortwave bands in order to preserve its unique ability to carry information over long distances with very little power. BPL signals could potentially be monitored hundreds or thousands of miles from their point of origin. This could cause BPL to interfere with itself under the right natural propagation conditions. Power lines that originally transmitted the offending BPL signals would make good receiving antennas at certain resonant frequencies. Interference from BPL signals could even become international under certain conditions. This is especially true if part 15 regulations were relaxed to allow for greater power levels for BPL. The International Telecommunications Union would then have a cause to complain about BPL technology. Every effort should be made to reduce manmade interference to the precious resource of the HF radio spectrum. The HF spectrum should not be wasted on a consumer broadband internet connection.

National security may depend upon a clean local HF signal. The National Security Agency and the Central Intelligence Agency have not discounted HF radio as a viable clandestine means of communication. They routinely monitor all manner of communications in this part of the radio spectrum. For instance, the Ana Belen Montes spy case at the Defense Intelligence Agency utilized shortwave communications from Cuba. This case may have turned out differently had alternate and presumably more private means of communication been chosen. An unusable HF spectrum would

force many to seek other means of communication, making it harder to gain intelligence from abroad based upon local reception.

A widely accessible broadband connection to the internet would be a good idea according to earlier remarks by the Commission. But, this type of internet connection is a bad idea because of security concerns.

An unshielded broadband connection of this type is subject to interference by nearby radio transmitters. The ARRL has found that as little as five watts of radiated power near a power line containing a BPL signal will cause data loss as a result of the interference. All mobile and base communications would potentially create substantial local disruption of broadband connections. Whether deliberate or unintentional, radio transmissions near power lines would cause a disruption to an internet infrastructure based upon BPL technology.

The unintended "wireless" nature of BPL would lend itself to unscrupulous activity. Current "WiFi" technology has recently been plagued by computer "hackers" who intercept and decode information for their own benefit. Everything from taking advantage of a neighbor's unsecured broadband connection to information theft has undoubtedly occurred. BPL is just "WiFi" at lower frequencies. The modulation protocol of BPL should be widely available as a standard. So, it would be a safe assumption that someone could find a way to remotely transmit and receive data not intended for themselves or a targeted receiver. They would be able to do this directly through a power line connection or through the air via radio even while mobile.

In summary, the current state-of-the-art in BPL technologies will unquestionably cause severe interference to the HF radio spectrum. Licensed users will be forced to file endless complaints requesting the FCC to mitigate the interference. The only option for solving this type of interference would be to cease operation of the BPL service. This would undoubtedly be unacceptable to the BPL industry and to the public who is generally ignorant of radio frequency regulation. As stated by the ARRL, any complaints about BPL would be a substantial regulatory burden to the FCC.

Therefore, I ask that the Federal Communications Commission take no further steps to allow the deployment of BPL technologies utilizing radio frequencies.

Respectfully submitted,

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